Highway Development Corridors: Growth Along US Interstate Highways

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Economic effects of US Interstate Highway System

- National scale: economic integration and expansion of formerly peripheral areas
- Regional scale: creation of corridors linking urban areas around the country

Interstate corridors receive policy attention from two perspectives:

- Transport corridors
- Economic development corridors

Economic development along interstates is uneven

- Why do some corridors spur economic development?
- Can we identify factors that enhance the growth stimuli offered by transport improvements?

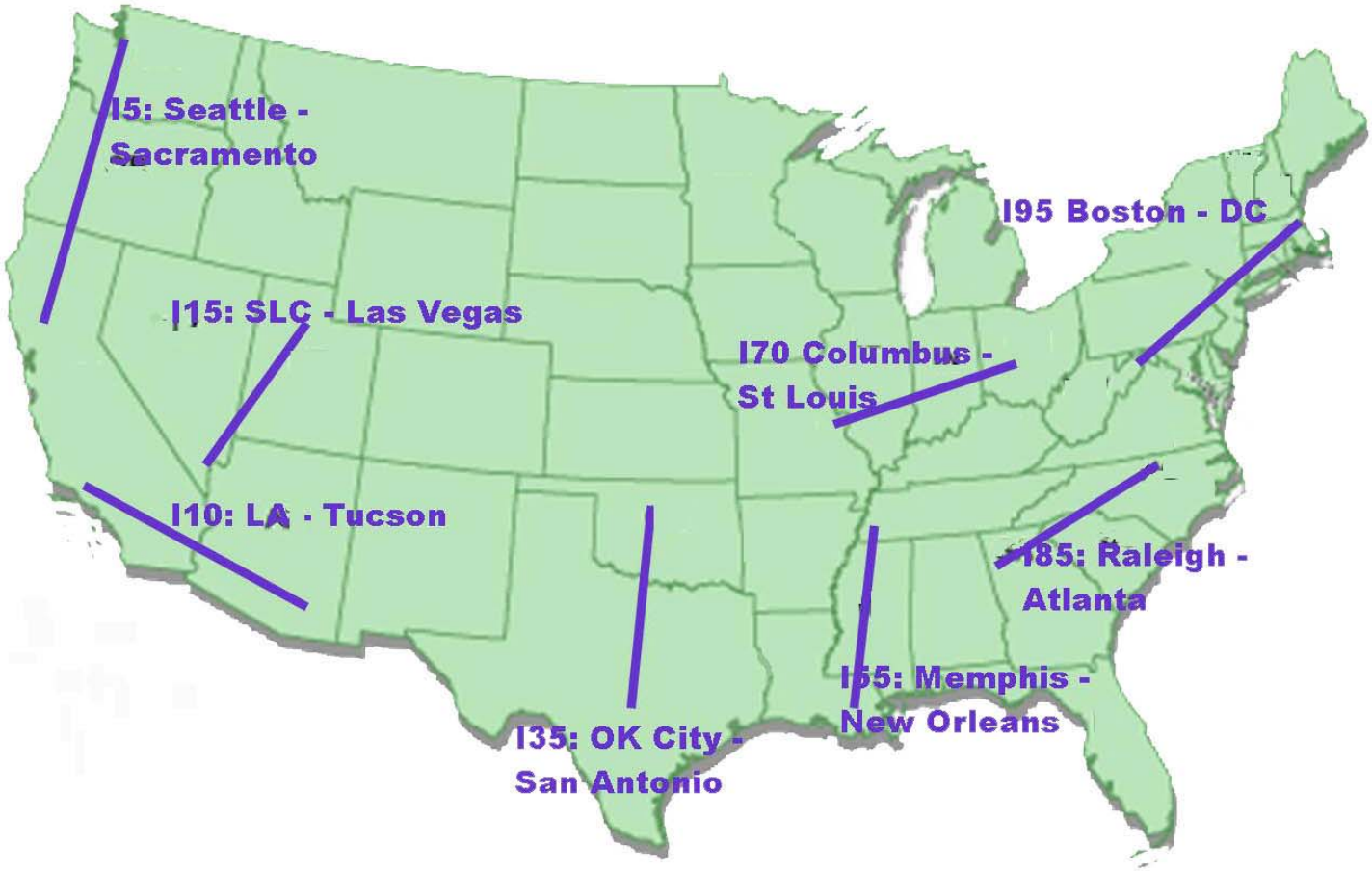
Study objectives

- To examine whether corridor regions defined by interstate highways are functional economic regions;
- To identify the share of economic growth along highway corridors that may be attributable to local conditions, as opposed to national or industry trends; and
- To begin to identify those local factors that may act synergistically with transportation infrastructure, such that economic development generates from or is drawn to the highway corridor.

Corridor selection

- Study corridors should be anchored at both ends by relatively large cities.
- Interstate counties should be a mix of urban and rural.
- Study corridors should be no more than a 10 hour drive, the maximum that truckers may drive per day.
- The study corridors should represent both fast-growing regions with newer industries and older, established regions.

Study Corridors



Economic Integration in Highway Corridors

Do the study corridors constitute functional economic regions?

Basic gravity model:

$$\mathbf{lnYij = a0 + a1ln(M)i + a2ln(M)j + a3ln(DISTij) + a4(DUMMY) + eij}$$

where

- Yij is some measure of flows from place i to j;
- Mi and Mj are measures of the size (or “mass”) of i and j;
- DISTij is the distance between them; and
- DUMMY variable = 1 for pairs i and j that possess some characteristic whose importance is being assessed.
- eij is a random error term.

$$\ln Yij = a0 + a1\ln(M)i + a2\ln(M)j + a3\ln(DISTij) + a4(DUMMY) + eij$$

For our purposes:

- Yij is measured as freight deliveries from i to j;
- Mi is the aggregate freight shipments originating from origin i;
- Mj is the population of destination j, which serves as a proxy for demand potential;
- DUMMY variable takes the value of 1 for pairs i and j are located within a certain highway corridor and 0 otherwise.

Intracorridor Dummy Variable Coefficients across Study Corridors

Gravity Model Version	*Dummy Variable coefficient*		
	Positive and Statistically Significant (0.05 level)	**Positive but not Statistically Significant (0.06-0.10)**	**Negative but not Statistically Significant**
Dependent Variable: Tons of Outbound Shipments:	I-85, I-5, I-95, I-35, I-10	I-15, I-70	I-55
Dependent Variable: Value of Outbound Shipments:	I-85, I-70	I-5, I-95, I-35	I-15, I-10, I-55

Statistical Analyses of Study Corridors

- Aggregate patterns of growth
- Shift Share Analyses

Aggregate patterns of growth

	Employment Growth (%)	Earnings Growth, Constant Dollars (%)			
		Mfg	FIRE	Services	Total [other]
US	83%	25%	297%	301%	124%
I-5	141%	74%	311%	517%	208%
I-10	105%	3%	244%	281%	116%
I-15	352%	177%	914%	616%	429%
I-35	168%	155%	373%	507%	303%
I-55	61%	15%	172%	240%	98%
I-70	65%	0%	245%	328%	94%
I-85	134%	97%	462%	570%	251%
I-95	30%	-23%	284%	228%	77%

Structural change

Shift-Share Analysis: Decomposes regional economic change (expressed in terms of employment, wages, earnings, income, etc.) into three additive components:

- National Share (NS)
- Proportionality Share or Industrial Mix Component (PS)
- Differential Share or Competitive Share (DS)

Total Shift (TS) = NS + PS + DS

Competitive Shares of Employment by Major Sector, 1969-1985 and 1985-2000, for Selected Corridors (Reference Region: US)

	I-5		I-35		I-70	
Sector	1969-1985	1985-2000	1969-1985	1985-2000	1969-1985	1985-2000
Mfg	14.79%	20.04%	49.40%	21.25%	-15.52%	7.73%
FIRE	4.97%	12.09%	69.97%	9.71%	-19.76%	-0.05%
Services	32.15%	22.13%	37.83%	30.48%	1.51%	-4.42%

	I-85		I-95	
Sector	1969-1985	1985-2000	1969-1985	1985-2000
Mfg	14.18%	3.34%	-22.43%	-30.56%
FIRE	7.62%	16.31%	-27.96%	-8.83%
Services	2.50%	40.89%	-22.27%	-23.41%

Competitive Shares of Earnings Growth by Selected Subsector, 1969-1985 and 1985-2000

Sector	I-5				I-70			
	1969-1985		1985-2000		1969-1985		1985-2000	
	N	R	N	R	N	R	N	R
Electronics	198.89%	64.70%	640.13%	599.46%	-248.46%	-110.47%	-63.76%	-35.05%
Instruments	1081.69%	420.90%	857.43%	689.87%	292.21%	418.57%	-49.64%	-22.29%
Depository institutions	13.19%	-76.05%	21.25%	49.79%	-241.73%	-122.47%	224.93%	217.04%
Business services	286.56%	157.82%	563.53%	470.18%	174.87%	248.03%	-28.92%	29.48%
Health services	21.09%	26.64%	28.70%	58.26%	94.65%	146.61%	-0.34%	24.38%
Legal services	275.49%	31.94%	13.97%	-13.73%	-118.29%	38.67%	32.71%	40.22%

Sector	I-85				I-95			
	1969-1985		1985-2000		1969-1985		1985-2000	
	N	R	N	R	N	R	N	R
Electronics	325.67%	-13.33%	87.71%	97.47%	-130.65%	-84.27%	-66.17%	-5.68%
Instruments	1175.49%	968.89%	422.35%	176.30%	-88.77%	24.46%	-90.42%	-0.23%
Depository institutions	17.66%	-85.30%	181.28%	120.41%	-124.01%	-66.11%	52.27%	65.84%
Business services	446.64%	230.44%	277.66%	154.27%	-108.60%	84.57%	-118.33%	-19.89%
Health services	111.42%	-45.92%	123.69%	72.16%	-54.27%	9.22%	-18.31%	-3.27%
Legal services	242.55%	145.01%	87.43%	46.42%	-80.85%	19.43%	29.84%	40.85%

Conclusions

Circumstantial evidence for interstate growth effects:

- Most of the interstate corridors appear to be functional economic regions.
- Shift share analyses indicate that in five of our eight study corridors, the economic performance of the corridor region since 1969 was better than what might have been expected given its initial mix of industries and the region in which it is located.
- Economic development along interstate corridors appears to be mediated by contextual factors including regional location, inherited industrial structure, and degree of urbanization.